REMARKS

This Amendment, submitted in response to the Office Action dated October 25, 2004, is believed to be fully responsive to each point of rejection raised therein. Accordingly, favorable reconsideration on the merits is respectfully requested.

Claims 1-61 are now pending in the present application.

I.   Claim Rejections under 35 U.S.C. § 102

Claims 15-26, 38, 39, 45 and 46 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Saber et al. (Face Detection and Facial Feature Extraction Using Color, Shape and Symmetry-based Cost Functions; IEEE Proceedings on Pattern Recognition, ISBN: 1015-4651).

Claim 15 recites "wherein a first extraction area is extracted according to a shape of regular geometric form of the specified image subject."

In Saber, a human face is detected by first applying an adaptive color classification algorithm to E and S channels to segment an image into either a skin class or "other" class. After classifying a color, a morphological or Gibbs random field model-based smoothing is performed to yield continuous regions. Then, eigenvalues and eigenvectors of the skin spatial covariance matrix are utilized to fit an ellipse to the skin region. See Section 2, first paragraph under "The Method." Therefore, in Saber, a first extraction area is obtained by an adaptive color classification algorithm and is not obtained according to a shape of regular geometric form. In particular, the fitting of eigenvalues and eigenventures into an ellipse does not occur until after skin classification.

Further, claim 15 has been amended to recite extracting a plurality of extraction areas as candidate specified image subject regions. Applicant submits there is no disclosure of extracting a plurality of extraction areas as candidate specified image subject regions in Saber.

For at least the above reasons, claim 15 and its dependent claims should be deemed patentable.

II.   Rejection of claims 1, 8, 27, 40, 41 and 43 under 35 U.S.C. § 103

Claims 1, 8, 27, 40, 41 and 43 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Nguyen et al. (Segmentation, Grouping and feature Detection for Face Analysis; IEEE Proceedings in Computer Vision, ISBN: 0-8186-7190-4) in view of Saber.

Nguyen discloses a method of detecting features of a face by implementing three steps: 1) extraction of silhouette and head image, 2) analysis within a head image using skin segmentation and face orientation (finalized by an ellipse) and feature detection/grouping and 3) combined analysis of face-ellipse and facial features to verify the face hypothesis. See first paragraph of section 2.3. As illustrated in Fig. 2, row 1, a silhouette of a head is obtained. After the silhouette of a head image is obtained, skin region segmentation and feature detection is performed and histogram analysis is carried out to estimate skin intensity levels and feature contrast. Once the composite face-skin group has been found, analysis of size, shape, location, orientation are performed to compute the likelihood of face orientations. The view estimate then provides information to compute adjustment of the face ellipse location and orientation. See section 2.3.

As illustrated in Fig. 2, an ellipse is not used in Nguyen until after a silhouette of a head image is obtained by course-level edge-based segmentation.

The Examiner states that Nguyen does not disclose that the precedent stage comprises "extracting a shape of regular geometric form of the specified image subject" and cites Saber to cure the deficiency.

The aspect of Saber cited by the Examiner describes the extraction of a skin region by fitting an ellipse. However, the extraction of a skin region is not the precedent stage (extraction of silhouette of head image) cited by the Examiner. The description of the ellipse is described towards final stages, rather than precedent stages.

Assuming *arguendo*, Saber teaches the claimed precedent stage extracting a shape of regular geometric form of the specified image subject, the combination of Saber and Nguyen is not obvious. In particular, Nguyen does not desire that the extraction of a silhouette of a head image (precedent stage) be performed by using an ellipse. In particular, the extraction of a silhouette of a head image in Nguyen is performed by a course-level edge-based segmentation. Nguyen notes that the orientation of the face in different angles and views. Since Nguyen seeks to use the same procedure regardless of view, Nguyen would not use the shape detection at a precedent stage. Page 593, col. 1, para. 2.

The Examiner contends that it would be useful to combine Saber and Nguyen since an ellipse is a reliable indicator of a face. However, this presupposes a frontal view. Since Nguyen is addressed to addressing multiple views in a consistent manner, Nguyen teaches away from the

precedent stage processing as claimed. Consequently, modifying the extraction of a silhouette in

Nguyen by using an ellipse would result in a substantial modification of the principle of

operation of Nguyen, which can result in improper detection of the image desired in Nguyen.

This evidences that the Examiner's reasoning is merely a result of impermissible hindsight.

For at least the above reasons, claim 1 and its dependent claims should be deemed

patentable. Since claim 8 recites similar elements, claim 8 and its dependent claims should be

deemed patentable for the same reasons.

Claim 27

Claim 27 recites that the subsequent stage comprises "detecting a color or hue of the

specified image subject." The Examiner cites skin-segmentation and face-orientation for

teaching "changing an extracting condition of a subsequent stage" as recited in claim 1.

However, candidate skin regions are analyzed by size, shape, location, orientation and the most

likely candidates are grouped into the composite face-skin region. There is no indication that the

subsequent stage comprises detecting a color or hue of the specified image subject. Therefore,

claim 27 should be deemed patentable.

Since claim 40 recites similar elements, it should be deemed patentable for the same

reason. The Examiner cites section 1.3 of Nguyen for teaching the elements of claim 40,

however, the color-based segmentation cited by the Examiner refers to a Cha reference and is not

disclosed in the Nguyen reference. Further, assuming the Examiner is citing the Cha reference

for teaching the elements of claim 40, the Examiner has provided no motivation for the

combination of Cha with Nguyen and Saber.

III.　　Rejection of claims 2-7, 9-14, 32-35, 42 and 44 under 35 U.S.C. § 103

Claims 2-7, 9-14, 32-35, 42 and 44 have been rejected under 35 U.S.C. § 103(a) as being

unpatentable over Nguyen in view of Saber and Ohmi et al. (U.S. Patent No. 5,923,779)

Since claims 2 and 9 recite elements similar to claim 1, claims 2 and 9 and their

dependent claims should be deemed patentable for at least the same reasons.

The Examiner states that neither Nguyen or Saber teaches the parallel processing of

claims 2 and 9 and cites Ohmni to cure the deficiency. Ohmi teaches extracting characteristics

of a face, such as outline of the face, shape of the hair, shape of the eyes, shape of the nose and

shape of the mouth which are divided into 50 different types. The closest shape is then

determined. Col. 5, line 65 to column 6, line 4.

As previously submitted, there is no indication that extracting algorithms in a subsequent

stage are performed according to the extracting states in a precedent stage in the parallel

processing. In particular, it appears that all of the 50 extracted images are from the same stage.

The objective of providing an instantaneous recognition of data would teach away from the

sequenced operations as claimed.

Furthermore, the combination of Ohmi with Nguyen and Saber is not supportable. Ohmi

determines a face, hair, eyes, nose and mouth by extracting multiple possibilities as to where

those features are located on an image. In Saber, the location of nose and mouth are calculated

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according to a distance from a center of the eyes. In Nguyen, the location of the eyes and mouth are detected using an ellipse within a silhouette of a head image. Therefore, there is no need to obtain all the possible eyes, noses and mouths resulting in the parallel processing of Ohmi, with Saber and Nguyen. For at least these reasons claim 2 and its dependent claims should be deemed patentable. Since claim 9 describes similar elements, claim 9 and its dependent claims should also be deemed patentable.

Claim 32

The Examiner rejects claim 32 for the same reasons as claims 2 and 9. However, claim 32 recites that the plurality of specified image subject extracting algorithms in each stage of the plurality of stages are implemented at the same time, which is not recited in claims 2 and 9. Moreover, there is no indication that algorithms applied in each of the stages of Ohmi are implemented at the same time and the Examiner has not established otherwise. Therefore, for at least this reason claim 32 should be deemed patentable. Since claim 33 describes similar elements, it should be deemed patentable for the same reason.

Claim 34

Claim 34 describes that "the image subject extraction parallel processing unit comprises skin color extraction, face contour extraction, hair-on-head extraction, eye/nose/mouth/eyebrow extraction, body extraction, and non-background area extraction." The Examiner asserts that a combination of Saber and Ohmi teaches the elements of claim 34. However, neither Saber nor Ohmni disclose extracting an eyebrow, body, or non-background area nor is there any indication

that an eyebrow, body, or non-background area extraction is performed by *parallel processing*.

Therefore, for at least this reason claim 34 should be deemed patentable. Since claim 35

describes similar elements, it should be deemed patentable for the same reason.

IV.   Rejection of claims 28 and 29 under 35 U.S.C. § 103

Claims 28 and 29 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over

Nguyen in view of Saber and Hasegawa et al. (Real-time Parallel and Cooperative Recognition

of Facial Images for an Interactive Visual Human Interface; IEEE Paper ISBN: 1051-4651).

Claims 28 and 29 should be deemed patentable by virtue of their dependency to claims 1

and 8 for at least the reasons set forth above.

Further, claim 28 recites that the "predetermined extracting condition comprises

electronic flash or backlight information." Although the experiments in Hasegawa are

performed in a standard indoor environment in the day time (fluorescent lights and the sunlight

from windows) and in the evening (fluorescent lights only), see section 5.1.1, there is no

indication that a predetermined extracting condition of a precedent stage comprises electronic

flash or backlight information. In particular, an initial extraction is performed in Hasegawa

according to an image that is nearest and faces a camera.

For at least the above reasons, claim 28 should be deemed patentable. Since claim 29-31

recite similar elements, they should be deemed patentable for the same reasons.

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V.   Rejection of claims 30 and 31 under 35 U.S.C. § 103

Claims 30 and 31 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Nguyen in view of Saber, Ohmi and Hasegawa. Claims 30 and 31 should be deemed patentable by virtue of their dependency to claims 2 and 9 for at least the reasons set forth above.

VI.   Rejection of claims 36 and 37 under § 103(a)

Claims 36 and 37 have been rejected over Nguyen in view of Saber, Ohmi and Wurtz ("Object Reconstruction Robust Under Transitions, Deformations, and Changes in Background", IEEE Transactions on Pattern Analysis and Machine Intelligence, ISBN: 0162-8828).

Claim 36 recites that the algorithms comprise different degrees of resolution. The Examiner states that Nguyen, Saber and Ohmi do not teach the elements of claim 36 and cites Wurtz section 2.1 and 2.2 to cure the deficiency. As previously submitted, Section 2.1 describes extracting features according to a 2-D Gabor function. Section 2.2 describes the sampling of a frequency space. There is no indication that an algorithm for extracting an image subject comprises different degrees of resolution.

Furthermore, the combination of Nguyen, Saber, Ohmi and Wurtz is not obvious since they teach contrary methods of obtaining an image subject. Therefore, the combination of Saber, Ohmi and Wurtz do not teach the elements of claim 36, for at least these reasons claim 36 should be deemed patentable. Since claim 37 describes similar elements, it should be patentable for the same reasons.
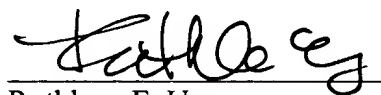
VII.   New Claims

Applicant has added claims 47-61 to provide a more varied scope of protection. Claims 47-61 should be deemed patentable by virtue of their dependency to independent claims for the reasons set forth above.

VIII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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WASHINGTON OFFICE
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